

## ANSWERING COMPLEX HYDROLOGIC QUESTIONS ACROSS MONTANA

### Science-Based Water Management for Montana

The Ground Water Investigation Program (GWIP) answers locally identified, site-specific questions prioritized by the Montana Ground Water Steering Committee (MCA 85-2-525). As mandated by the Montana Legislature, GWIP conducts research on the most urgent water issues in the State.

#### Examples of GWIP research topics:

- ✓ Complex groundwater–surface-water interactions and stream depletion
- ✓ Changes to aquifer recharge from changes in irrigation methods
- ✓ Hydrologic effects of land-use changes (such as from agricultural to residential)
- ✓ Enhanced aquifer storage and recovery

#### GWIP in the Montana State Water Plan

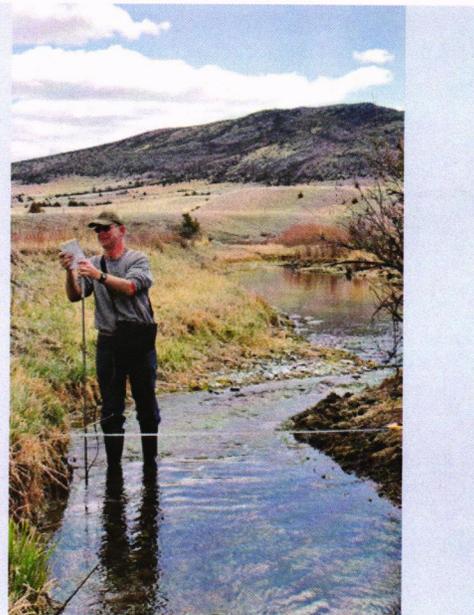
##### Water Supply and Demand

*“Ensuring an adequate supply of water to meet current beneficial uses and future demands is a theme echoed by the four Advisory Councils...”*

##### Recommendations from the 2015 State Water Plan:

GWIP’s mission follows recommendations from the water plan closely. These are critical pieces of What We Do:

- Investigate impacts of changing irrigation methods
- Evaluate mitigations to offset impacts of groundwater use on surface water
- Investigate enhancing aquifer recharge through diverting high spring flows
- Ensure aquifer information and modeling tools are available for conjunctive use management
- Investigate the feasibility of aquifer storage and recovery



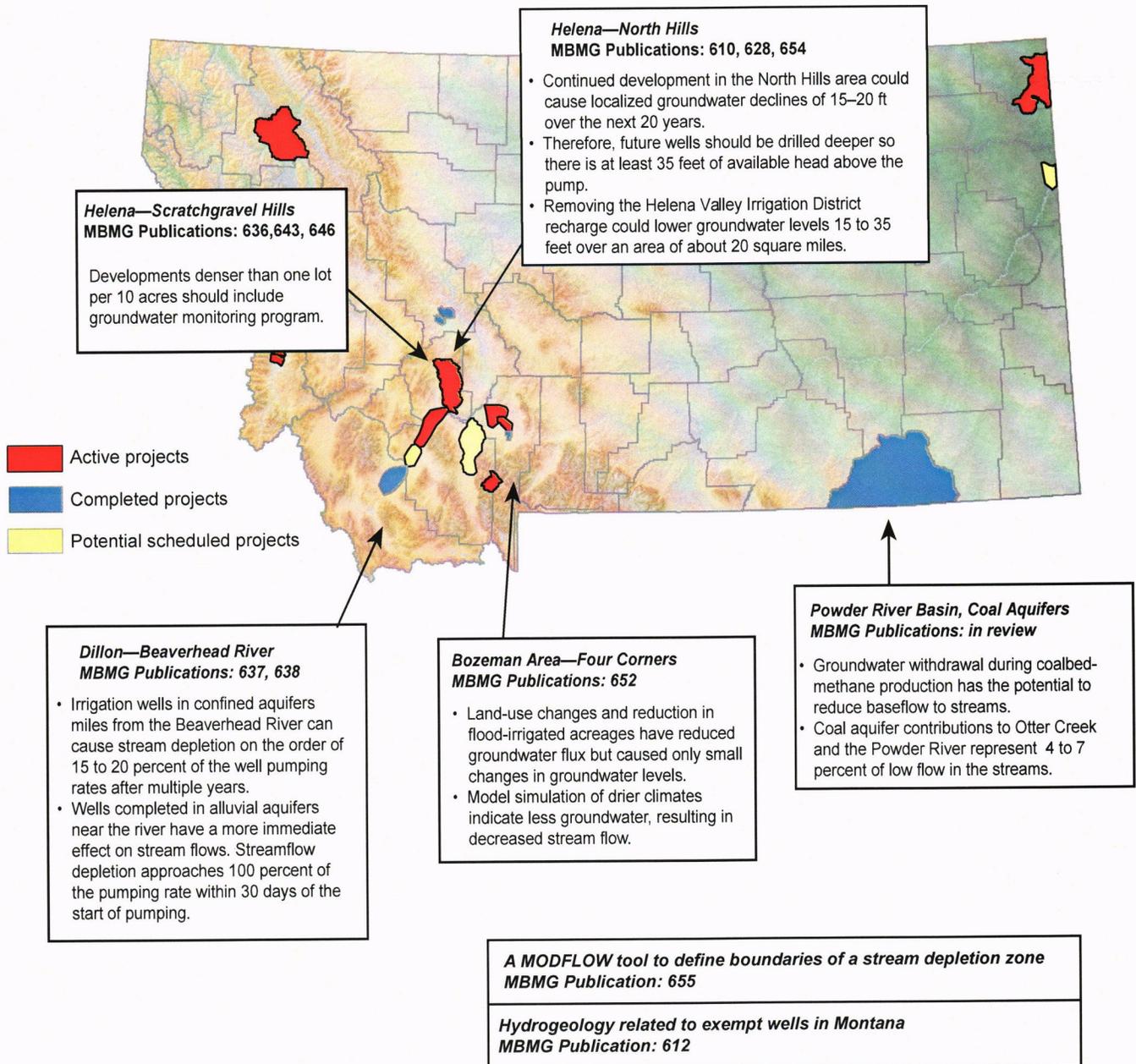
#### Projects Nominated for 2016

The following nominations were added in 2015. If selected by the Groundwater Steering Committee, project investigations will commence in 2016.

- **Helena Valley East Bench**—subdivision development and declining water levels
- **Gallatin River Basin**—hydrologic analyses of a possible Mitigation Bank
- **West Billings**—impact of land-use change on nitrate in groundwater
- **Upper Gallatin River Corridor**—impacts of existing and proposed development on streamflow
- **Wise River Watershed**—assessment or modeling of the effects of proposed drought planning
- **Enhancing natural storage**—effects of beaver mimicry structures on surface water and groundwater
- **Lolo Creek, Missoula**—investigate causes of creek dewatering
- **Virginia City**—investigate potential for management of water resources
- **Clear Lake Aquifer, northeast Montana**—develop a detailed aquifer management model
- **Gallatin River Ranch**—hydrogeologic investigation to support a viable water management plan
- **East Gallatin River, Bridger Range area**—effects on water availability due to residential development

*To date, over 60 projects have been nominated for GWIP.*

## GWIP research produces water management tools for Montana



### Results are offered to the public through reports, presentations, and data:

Reports are available online: [http://www.mbmgt.mtech.edu/gwip/gwip\\_reports.asp](http://www.mbmgt.mtech.edu/gwip/gwip_reports.asp).  
 10 detailed, peer-reviewed MBMG reports have been published, with more in review.

Modeling files can be downloaded with associated modeling reports.  
 4 computer models of site-specific groundwater flow are now available to the public for continued use.

Data are available on GWIC: <http://mbmggwic.mtech.edu>.  
 Comprehensive set of hydrogeologic data for each site are permanently stored online.